

**U.S.S.N. 10/700,220
S. Bharitkar et al.
Response to Office Action and Request for Reconsideration**

REMARKS

Claims 1-22 are pending in this continuation-in-part application. Attached hereto is a complete listing of all claims in the application, with their current status listed parenthetically. By this response, claims 7, 13, and 18 are canceled. Claim 21 has been amended to correct an obvious typographical error and not in response to the prior art. These claim cancellations are made to correct duplication in the claims as previously written and not in response to the prior art. The applicants Response to Office Action dated April 10, 2008 is hereby incorporated by reference in its entirety.

Response to Arguments

Applicant notes with appreciation the Examiner's withdraw of the previous rejection regarding the warped correction filter being the inverse of the low order spectral model. Further, in maintaining the rejection that Abel [10: 5-14] renders obvious computing the weighted average of the warped acoustic filter, the Examiner acknowledges that Abel [10: 5-14] does not teach computing a weighted average of a warped acoustic filter, but head related transfer functions.

Double Patenting

On pages 3 and 4 the Examiner provisionally rejects claims 1, - 4, in the present application (the '220 application)under the judicially created doctrine of obvious type double patenting in view of co-pending U.S. Patent Application Serial Nr. 10/465,644 (the '644 application). The applicant respectfully traverses this rejection. The applicant notes that the Examiner has dropped the provisional rejection with respect to claims 7, and 17.

At the onset the Applicant notes that the Examiner's rejection is completely improper in its use of the Abel reference is asserting a provisional obviousness type double patenting rejection. The Examiner's attention is directed to MPEP §804 III which states in relevant part.

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"Rejections over a patent or another copending application based on double patenting or 35 U.S.C. 103(a) are similar in the sense that both require comparison of the claimed subject matter with at least part of the content of another patent or application, and both may require that an obviousness analysis be made. However, there are significant differences between a rejection based on double patenting and one based on 35 U.S.C. 102(e) prior art under 35 U.S.C. 103(a). *In re Bartfeld*, 925 F.2d 1450, 17 USPQ2d 1885 (Fed. Cir. 1991).

One significant difference is that a double patenting rejection must rely on a comparison with the claims in an issued or to be issued patent, whereas an >anticipation or< obviousness rejection based on the same patent under 35 U.S.C. 102(e)/103(a) relies on a comparison with what is disclosed (whether or not claimed) in the same issued or to be issued patent. In a 35 U.S.C. 102(e)/103(a) rejection over a prior art patent, the reference patent is available for all that it fairly discloses to one of ordinary skill in the art, regardless of what is claimed. *In re Bowers*, 359 F.2d 886, 149 USPQ 570 (CCPA 1966)." (emphasis added)

See also *Quad Environmental Technologies Corp. v. Union Sanitary District*, 946 F.2d 870, 20 USPQ2d 1392 (Fed. Cir. 1991) which states:

"Only the claims are compared in a rejection for double patenting. Such a rejection by the patent office does not mean that the first-filed patent is prior art under §102 against the later filed application" (emphasis added)

The Examiner's use of the Abel reference to support a provisional obviousness type double patenting rejection is clearly improper and the rejection should be withdrawn on that basis alone.

A claim chart illustrating the differences in scope between the claims was provided in the previous response and relevant portions are repeated here.

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Pending Claims as of 12/20/07 for USSN 10/700,220	Pending Claims as of 03/18/2008 for USSN 10/465,644
1. A method for correcting room acoustics at multiple-listener positions, the method comprising:	1. A method for correcting room acoustics at multiple-listener positions, the method comprising the steps of:
measuring a room acoustical response at each listener position in a multiple-listener environment;	measuring a <u>time domain</u> room acoustical response at each listener position in a multiple-listener environment,
	the room acoustical response including a loudspeaker response and a room response;
warping each of the room acoustical response measured at said each listener position;	
determining a general response by computing a weighted average of the <u>warped</u> room acoustical responses;	determining a general response by computing a weighted average of <u>time domain</u> the room acoustical responses; and
generating a low order spectral model of the general response;	
obtaining a <u>warped</u> acoustic correction filter from the <u>low order spectral model</u> , wherein the warped acoustic correction filter is the inverse of the low order spectral model; and	obtaining a <u>room</u> acoustic correction filter from the <u>general response</u> ;

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unwarping the warped acoustic correction filter to obtain a room acoustic correction filter;	
wherein the room acoustic correction filter corrects the room acoustics at the multiple-listener positions.	wherein the room acoustic correction filter <u>simultaneously</u> corrects the room acoustics <u>and loudspeaker</u> acoustics at the multiple-listener positions.
2. The method of claim 1, further comprising generating a stimulus signal for measuring the room acoustical response at each of the listener positions.	2. The method according to claim 1, further including the step of generating a stimulus signal for measuring the room acoustical response at each of the listener positions.
	3. The method according to claim 2, further including the step of transmitting the stimulus signal from at least one loudspeaker.
	4. The method according to claim 3, wherein the stimulus signal is at least one of
	a logarithmic chirp signal,
	a broadband noise signal,
	a maximum length signal,
	or a white noise signal.

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Pending Claims as of 12/20/07 for USSN 10/700,220	Pending Claims as of 03/18/2008 for USSN 10/465,644
3. The method according to claim 1, wherein the general response is determined by a pattern recognition method.	5. The method according to claim 1, wherein the general response is determined by a pattern recognition method.
4. The method of claim 3, wherein the pattern recognition method <u>comprises a method selected from a group consisting of:</u>	6. The method according to claim 5, wherein the pattern recognition method <u>is at least one of</u>
a hard c-means clustering method,	a hard c-means clustering method or
a fuzzy c-means clustering method,	a fuzzy c-means clustering method.
and an adaptive learning method.	

As to claims 1, 3, and 4 the Examiner states:

"The '644 claims 1, 5-6 are a broader recitation of the same invention claimed in '220 claim 1, 3-4."

The Examiner's attention is respectfully directed to the above chart clearly illustrating that this assertion is erroneous. The claims of the '644 application contain elements which simply are not present in the claims of the '220 application. In like manner, claims in the '220 contain elements that are simply not present in the claims of the '644 application. This assertion is an egregious misrepresentation, and the Examiner is respectfully invited to reconsider. With respect to the scope of the claims, it is important to note that the two independent claims are of different scope. Clearly, these claims are not encompassed within each other in any manner. Applicant submits that these claims are patently distinct and the Examiner's provisional double patenting

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rejection is traversed. Applicant respectfully requests the Examiner reconsider and withdraw this provisional rejection.

As to claim 2 the Examiner states:

"The '220 claim 2 is a broader recitation of the same invention claimed in '644 claims 2, 3 and 4. Therefore, '644 claims 2, 3 and 4 are encompassed by '220 claim 2. It is critical that patents issuing from these applications be commonly owned to avoid potential licensees from owing licensing fees to two different parties."

With respect to claim 2 of the '220 application and to claims 2, 3, and 4 of the '644 application, the claims are dependent from their respective independent claims 1. For the above noted reasons the claims are patently distinct. The Examiner is respectfully reminded that "[i]f an independent claim is non-obvious under 35 U.S.C. § 103, then any claim depending therefrom is non-obvious." M.P.E.P. § 2143.03. Applicant submits that these claims are patently distinct and the Examiner's provisional double patenting rejection is traversed. Applicant respectfully requests the Examiner reconsider and withdraw this provisional rejection.

While it may be part of the public policy basis for the creation of the non-statutory obviousness type double patenting rejection that "[i]t is critical that patents issuing from these applications be commonly owned to avoid potential licensees from owing licensing fees to two different parties", this is not a condition of patentability under this doctrine. If the Examiner continues to maintain this, he is respectfully invited to provide supporting law.

Rejection Under 35 U.S.C. § 103

On page 5 of the Final Office Action, claims 1, 7-8, 13-14, 18 and 20 stand rejected as unpatentable under 35 U.S.C. § 103(a) over U.S. Patent Nr. 6, 072, 877 ("Abel") in view of U.S. Patent Nr. 5,771,294 ("Inoue"), and further in view of U.S. Patent No. 6,792,114 ("Kates"). As discussed below, the Applicant respectfully

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traverses this rejection. With respect to claims 7, 13, and 18 they have been canceled rendering this rejection moot.

The Law of Obviousness

M.P.E.P. 706.02(j) states:

"35 U.S.C. 103 authorizes a rejection where, to meet the claim, it is necessary to modify a single reference or to combine it with one or more references. After indicating that the rejection is under 35 U.S.C. 103, the Examiner should set forth in the Office Action:

(A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,

(B) the difference or differences in the claim over the applied reference(s),

(C) the proposed modification of the applied reference(s) to arrive at the claimed subject matter, and

(D) an explanation >as to< why > the claimed invention would have been obvious to< one of ordinary skill in the art at the time the invention was made**."

See also *M.P.E.P. 2143.03* which states:

"All words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson* 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103 then any claim depending therefrom is nonobvious. *In re Fine* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Additionally, as stated in the Final Office Action, the factual inquiries set forth in *Graham v. John Deere Co.* 383 U.S. 1, 148 USPQ 145 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or non-obviousness.

The Examiner's characterization of the scope and contents of the art are erroneous.

In rejecting claim 1 the Examiner states:

"Abel discloses a method for correcting room acoustics by warping each of the room acoustical response measured at said each listener position (fig. 7a: 121); determining a general response by computing a weighted average room acoustical responses (fig. 10: 74; col. 10, lines 11-14), generating a low order spectral model of the general response (fig. 10: 74; col. 30-36); obtaining a warped acoustic correction filter from the low order spectral model (fig. 10:75) unwarping (fig. 7a: 129) the warped acoustic correction filter."

At the onset the Applicant notes that the Examiner previously asserted that Abel taught "determining a general response by computing a weighted average of the warped room acoustical responses at multiple-listener positions (fig. 10: 74; col. 10, lines 11-14)," *See Office Action dated January 10, 2008*, and now asserts that the same cited portion teaches determining a general response by computing a weighted average room acoustical responses (fig. 10: 74; col. 10, lines 11-14). Further, in Response to Arguments, the Examiner "maintains his stand" by admitting that Abel teaches computing a weighted average of head related transfer functions not a room acoustical response.

At a minimum this assertion is also a mischaracterization of the elements "determining a general response by computing a weighted average of the warped room

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acoustical responses at multiple-listener positions"; "generating a low order spectral model of the general response" and "obtaining a warped acoustic correction filter from the low order spectral model". Abel (fig. 10: 74; col. 10, lines 11-14) states "[w]hen the equalization filter [74] is formed as a weighted average of HRTFs, the weighting should give more importance to longer more complex HRTFs" which the Examiner equates to a general response. Without prejudice to the propriety of this characterization, Abel then teaches that "[a]n input audio signal 73 is applied to an equalizing filter 74 and imaging filter 75 whose transfer function is determined by the applied interpolated equalized HRTF parameters. . . . The filter 75 provides for spatialized audio output suitable for application to one channel of a headphone." [Abel 9: 44-51; FIG. 10] The Examiner's attention is further directed to FIG. 10 which illustrates the output of imaging filter 75 going to headphone 77. Imaging filter 75 is therefore not a low order spectral model from which a warped acoustic correction filter is obtained. This is neither taught, suggested, or implied in Abel.

The Examiner further asserts that "Kates et al discloses a pole-zero model which is an inverse a low order spectral model [sic] (*Kates et al.*, col. 4 lines 5-16). The cited passage of Kates is reiterated here for the Examiner and the Board of Appeals' convenience.

"The impulse response of the feedback path can be obtained, for example, by using a periodic maximal-length sequence as the probe and accumulating the corresponding periods of the microphone response. The circular correlation of the microphone response with one period of the excitation will then give the impulse response of the feedback path. System identification techniques can then be used to produce an all-zero, all-pole, or pole-zero model of the feedback path from the impulse response. An alternative would be to excite the system with a white noise probe sequence and adapt a set of filter coefficients to produce the model of the feedback path."

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While, as Kates notes, system identification techniques are known in the art that can be used to derive a models from an impulse response, nothing in Kates teaches, suggests, or implies anything related to the Examiner's assertion that the pole-zero model of Kates is "an inverse a [of the] low order spectral model." Further, there is nothing in Kates that indicates that the pole-zero model can be derived from the low order spectral model, which is generated from the general response determined by computing a weighted average of the warped room acoustical responses.

In contrast, Kates teaches that the model is related to the feedback path and there is no indication within Kates of the order of the model. Kates further states

FIGS. 4-6 show configurations for performing measurement steps 206 and 306 of FIGS. 2 and 3. FIG. 4 is a block diagram showing a first measurement configuration. The characteristics of the feedback path, which includes the amplifier 404, receiver 406, and microphone 410 along with the acoustic and mechanical feedback 408, can be measured by exciting the system with a probe signal 402 and recording the response 412 at the hearing aid microphone 410.

which the Examiner must be equating to the general room response. This is simply not supported in the reference.

Further, employing common sense, one of ordinary skill in the art would not be motivated to modify the Abel reference to arrive at the asserted portions of the present invention because the reference does not teach "determining a general response by computing a weighted average of the warped room acoustical responses;" which the Examiner erroneously equates to equalizer 74; "generating a low order spectral model of the general response;" which the Examiner additionally equates to equalizer 74; and "obtaining a warped acoustic correction filter from the low order spectral model, wherein the warped acoustic correction filter is the inverse of the low order spectral model" which the Examiner equates to image filter 75. Abel does teach reducing the length of

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Head Related Transfer Functions by down sampling (FIG. 4a, 7:43-49) and deriving equalizer 74 from weighted averages of Head Related Transfer Functions (10:12-15). These simply are not the same thing.

The addition of the Inoue and Kates references fails to correct this deficiency.

The Examiner characterizations of the differences between the claims and the prior art are erroneous.

With the mischaracterization of the Abel reference the Examiner asserts that it teaches elements that are simply not present either explicitly or implicitly.

The proposed combination of the applied reference(s) does not arrive at the claimed subject matter.

Without prejudice to the propriety of combining Abel with Inoue and Kates, the proposed combination, for at least the above reasons does not arrive at the claimed subject matter. Stated more explicitly, the proposed combination fails to teach, suggest or imply "determining a general response by computing a weighted average of the warped room acoustical responses at multiple-listener positions"; "generating a low order spectral model of the general response"; and "obtaining a warped acoustic correction filter from the low order spectral model".

Further, the Examiner has not provided any analysis on how one of ordinary skill using these two references would add the missing elements of the claims. It is respectfully submitted that the rejection is traversed. The Examiner is invited to reconsider and withdraw the rejection to this claim.

The Examiner rejects claims 8, 14, and 20 as obvious over this same combination of references. The Examiner states "Claim 8 has been analyzed and rejected according to claim 1. Claim 14, has been analyzed and rejected according to

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claim 1. Claim 20 has been analyzed and rejected according to claim 1. Claims 7, 13, and 18 have been analyzed and rejected according to claim 1" Applicant submits that claims 8 and 14 contain similar limitations to claim 1 and for the same reasons described above these claims are patently distinct from the proposed combination of references. Claims 7, 13, and 18 have been canceled rendering this rejection moot. Applicant respectfully requests the Examiner reconsider and withdraw these rejections.

It is important to note that the Examiner has dropped his previous argument that the averaging of head related transfer functions equated to clustering the warped room acoustical responses, and the previous argument that the same averaging was equated to each cluster containing at least one centroid as required in claim 20. The Examiner makes no attempt to illustrate these elements, but merely states "[c]laim 20 has been analyzed and rejected according to claim 1." The Applicant respectfully submits that this rejection is improper and requests the Examiner to reconsider and withdraw it.

Applicant notes with appreciation that the Examiner has dropped the previous rejection to claim 2 under 35 U.S.C. §103(a). *See Office Action dated January 10, 2008 page 10.*

On page 7 of the Office Action claims 3-4, 9-10, and 15-16 are rejected under 35 U.S.C. 103(a) as obvious over Abel, Inoue and Kates in view of U.S. Patent Publication 2003/0200236 A1 (Hong). In rejecting claim 3 the Examiner states "the combined teachings of Abel, Inoue et al, and Kates disclose the method of claim 1, but fails to disclose . . ." As noted above the proposed combination of Abel, Inoue, and Kates fails to teach the method of claim 1. The addition of the Hong reference fails to correct the deficiency. With respect to claims 9 and 15 the Examiner states "Claim 9 has been analyzed and rejected according to claim 3"; and "Claim 15 has been analyzed and rejected according to claim 3." Applicant submits that claims 9 and 15 contain similar limitations to claim 3 and are patently distinct for the same reasons. With respect to

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claims 4, 10, and 16 it is submitted that they are distinct by virtue of their dependency from claims 3, 9, and 15 respectively.

On page 8 of the Office Action claims 5, 11, 17, and 21 are rejected under 35 U.S.C. 103(a) as obvious over Abel, Inoue, and Kates in view of U.S. Patent Nr. 6,980,655 (Kates II). The Examiner states "the combined teachings of Abel and Inoue et al disclose the method according to claim 1, but fails to teach . . ." As noted above the proposed combination of Abel and Inoue fails to teach the method of claim 1. The addition of Kates II reference fails to correct the deficiency. With respect to claims 11, 17, and 21 the Examiner states "Claim 11 has been analyzed and rejected according to claim 5"; "Claim 17 has been analyzed and rejected according to claim 5"; and "Claim 21 has been analyzed and rejected according to claim 5". Applicant submits that claims 11, 17 and 21 contain similar limitations to claim 5 and are patently distinct for the same reasons. Further, claim 21 is dependent from independent claim 20, and as noted above, the Examiner makes no attempt to analyze the elements of claim 20.

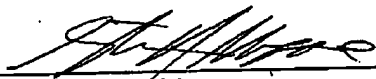
On page 9 of the Office Action claims 6, 12, and 19 are rejected under 35 U.S.C. 103(a) as obvious over Abel, Inoue and Kates in further view of U.S. Patent Nr. 6,956,955 (Brungart). The Examiner states "the combined teachings of Abel, Inoue et al, and Kates disclose the method according to claim 1, but fails to teach . . ." As noted above the proposed combination of Abel and Inoue fails to teach the method of claim 1. The addition of the Kates and Brungart references fails to correct the deficiency. With respect to claims 12, and 19 the Examiner states "Claim 12 has been analyzed and rejected according to claim 6" and "Claim 19 has been analyzed and rejected according to claim 6. Claim 22 has been analyzed and rejected according to claim 6" Applicant submits that claims 11, 17 and 22 contain similar limitations to claim 6 and are patently distinct for the same reasons. Further, claim 22 is dependent from independent claim 20, and as noted above, the Examiner makes no attempt to analyze the elements of claim 20.

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Conclusion

Applicant believes that this Response has addressed all items in the Office Action and now places the application in condition for allowance. accordingly, favorable reconsideration and allowance of claims 1-6, 8-12, and 19-22 is solicited. Should any issues remain unresolved, the Examiner is invited to telephone the undersigned.

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